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May 1929

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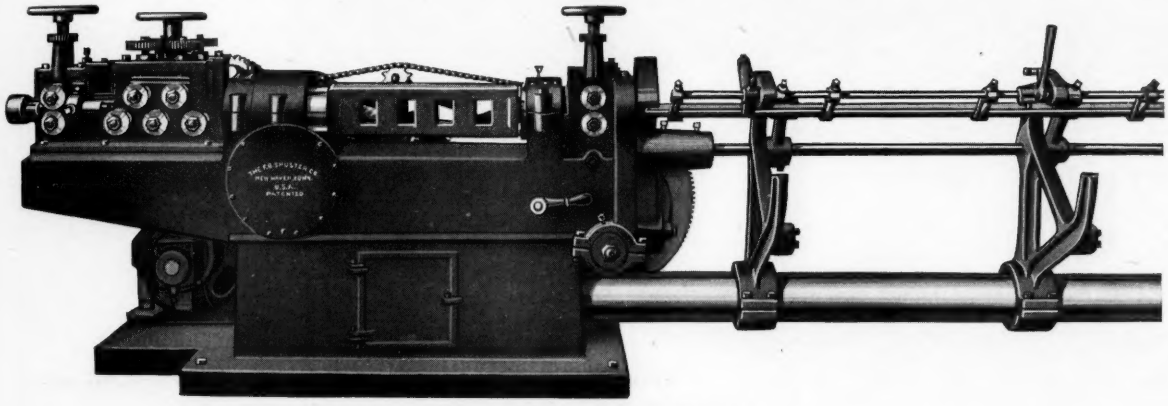
Wire Straightening and Cutting Machinery



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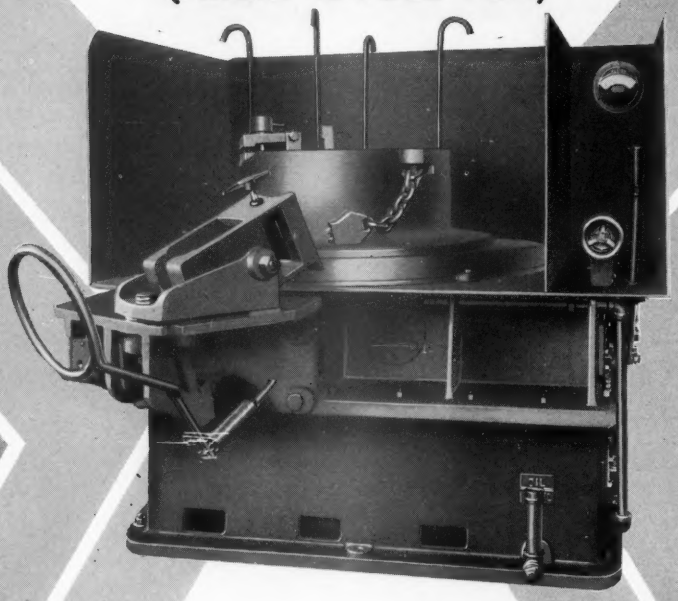

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SOME special instances of uses of copper wire in unit installments help us to visualize the enormous consumption that has resulted in the increasing demand for what market reporters allude to as the "red metal."

In the electrical equipment, for instance, of a ship the size of the new Canadian Pacific "Duchess", generating 1,900 kilowatts, we are told that there are over 1,000 miles of electrical cable.

The manufacturers of Colonel Lindbergh's famous "Spirit of St. Louis" use 146 feet of copper ignition cable in each plane in addition to a quantity of brass wire cloth.

In the building that houses *Wire & Wire Products* at 551 Fifth Avenue, there are five and one-half tons of cables for 1,638 telephones requiring 2,172,000 feet of wire.

The service in the Graybar Building, also in the Grand Central zone, requires thirteen and a half tons of cable carrying 6,000,000 feet of wire. In the new 56-story Chanin Building there are eight tons of riser cables containing 4,250,000 feet of wire, and the floor cables carry 350,000 additional feet.

The Equitable Building, on lower Broadway, has an office population comparable to that of a small city. Its 6,640 telephones require seven cables with 11,800,000 feet of wire weighing thirty-four tons, and other wiring adds another 1,000,000 feet. In a newer downtown building, The Equitable Trust, completed last year, 55,000 feet of riser cables are included in more than 10,000,000 feet of wiring.

That old familiar landmark to visitors, the Woolworth Building, contains eighteen tons of cables with 4,750,000 feet of wiring, and lesser high spots on the skyscraper horizon, such as the Whitehall Building and the Hudson Terminal Building, worry along with 2,500,000 feet and 4,000,000 feet respectively.

WIRE & WIRE PRODUCTS

A monthly publication devoted to wire drawing and wire forming

Vol. 4 May, 1929 No. 5

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Editor
Frank Quinn

Associate Editors
L. D. Granger George A. Paff

Contributing Editor
M. A. Hall

R. E. Brown, Business Manager

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Used Exclusively

in

These Dies

Why is it that European competitors are able to undersell the American wire manufacturer in spite of heavy tariff duties and transportation charges?

HERE ARE A FEW REASONS

Reduced Die Costs

They have succeeded in reducing die costs to a minimum with UN-WIDIA and WALLRAMITE dies, which in Continental practice have replaced the chilled iron, steel, and in the case of hard wire, diamond dies.

Increased Production

Production per machine has been increased from 25% to 35% due to increased drawing speed and continuous drawing with UN-WIDIA and WALLRAMITE dies.

Finer Quality Wire

The wire drawn with these dies is of a much finer quality and is made at a decreased cost.

Longer Die Life

With better quality of wire from the coarse wire machine, the diamond dies last twice as long on size when redrawing fine wire.

Reduced Labor Costs

Labor costs are reduced in direct proportion to increased machine production.

Reduced Manufacturing Costs

Die room costs are cut 75% or more and many of the usual cleaning operations are eliminated by the use of UN-WIDIA and WALLRAMITE dies.

Lower Die Costs

Considering the tonnage of wire drawn, the die cost is actually lower than that of chilled iron and steel dies.

UN-WIDIA and WALLRAMITE dies are manufactured and sold in the UNITED STATES, CANADA, MEXICO and FRANCE by the

Union Wire Die Corporation

EXCLUSIVELY

Manufacturers of diamond and alloy metal dies

333 WEST 52d STREET **NEW YORK CITY**

WIRE & WIRE PRODUCTS

Vol. 4 MAY, 1929 No. 5

New Furnace Revolutionizes Brass Melting

Cooperative industrial gas research results in development of new alloy retort of apparently indefinite life

A RADICALLY new type of brass melting furnace has been developed as a result of the American Gas Association's half-million dollar program of industrial gas research. For the first time in the history of the brass industry, the fragile and crumbling crucible and refractory lined furnace have been supplanted with a permanent retort of special alloy metal, apparently of indefinite life. Its advantages are summarized as follows:

Astoundingly low fuel consumption of only 2½ cubic feet of gas a pound of brass melted, superseding other fuels; practical elimination of metal losses during brass melting; apparent elimination of the costs of crucible and refractory maintenance; automatic temperature control; greatly improved working conditions in foundries, resulting in labor saving, greater efficiency of workers and avoidance of excessive heat, noise and fumes.

Foundrymen have never before known how to avoid the great loss of metal in brass melting, nor the heavy costs of crucible maintenance, and have been at a loss as to the most economical fuel for this use. In many types of furnaces, metal losses during operation equal or exceed the cost of fuel, whether gas, oil or coke.

Withstands High Temperatures

Through cooperative research between the American Gas Association and the American Gas Furnace Company at Elizabeth, N. J., there has been developed a metal alloy that will repeatedly withstand working temperatures in excess of 2,000 degrees Fahrenheit in contact with molten metal. While crucibles have a life of only 15 to 20 heats, the first retort made from this new alloy has already served for more than 250 heats and is none the worse for wear. The new brass melter consists of a revolving metallic retort, externally fired and enclosed in a shell for heat concentration, atmospheric control and fuel conservation. The heavily insulated sheet steel drum or shell is mounted on two bearings held by a steel frame so that it may be tilted at any desired angle. Ten gas burners, five on each side, are mounted on this drum in such manner that they fire into its interior. Within the drum is a special alloy metal retort so mounted that it revolves with a motor and variable chain and gear drive.

Heretofore under the best practice the volatilization losses during melting ran between five and six per cent, and each crucible when pulled from the furnace has to be skimmed of the oxidized metal before it can be taken to the pouring floor. These losses are now practically eliminated, as the only loss under this method is during the pouring operation and is so minimized that there is scarcely any variation in the chemical analysis of the castings. Furthermore, a more workable casting is produced, one that is more easily machined than those made from crucible metal.

The low fuel consumption of 2½ cubic feet of gas per pound of brass melted is one of the principal achievements of this furnace. Other economies include considerable labor saving and faster heat transfer which reduces the melting time and assists in lowering the fuel requirements. Another appreci-

(*Please turn to page 167*)

New Mill Treats Wire Manufacture as a Handling Problem

Sheffield Corporation routes a standard four-hundred-pound unit load throughout all operations in newly equipped plant

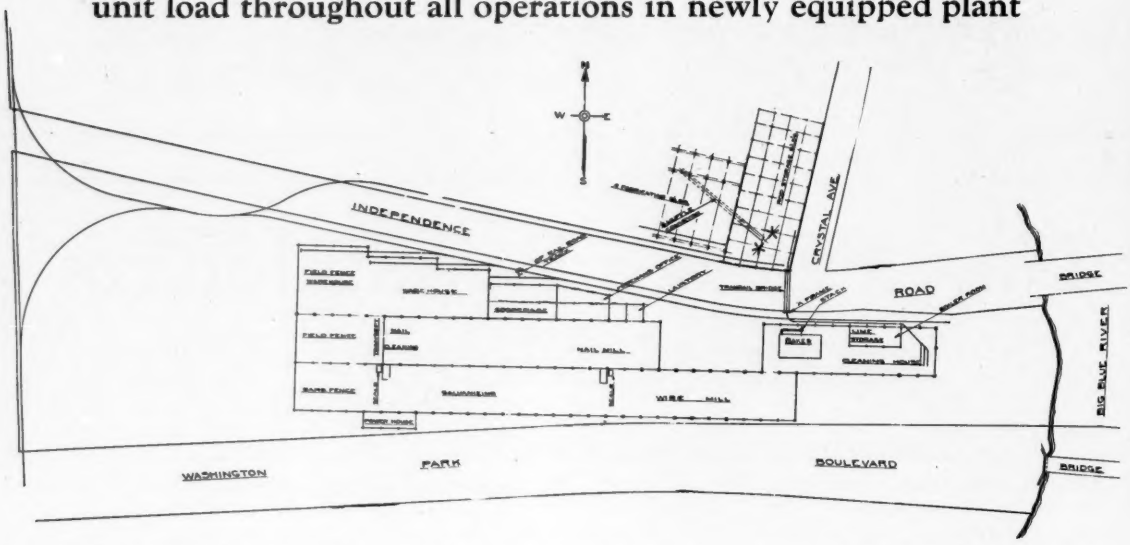


Fig. 1—Layout of Sheffield Steel Corporation's new wire mill showing tramrail bridge connection from rod storage building to cleaning house.

IN the last week of December 1928, the Sheffield Steel Corporation put into operation its new billet, rod and wire mills. The new wire mill is of especial interest as being the first instance in which the manufacture of wire products has been treated as primarily a handling problem, with building structure, layout and equipment coordinated to take advantage of all possible economies in handling. It is also the first mill in which the 400 pound bundle has been carried as the standard unit throughout all operations.

The plant is located in Sheffield, a suburb of Kansas City, Missouri, on the Kansas City Terminal, Missouri Pacific, and Kansas City Southern Railroads. Here the Sheffield Steel Corporation and its predecessor, the Kansas City Bolt & Nut Company, have been operating since 1888 a plant for manufacture of bar iron, bolts, nuts, track spikes and similar railway products. In 1919 open hearth furnaces were erected to take advantage of the large local scrap market. Billet and bar mills were added, as well as equipment for the production of blue annealed sheets, concrete re-enforcing bars and railway and industrial forgings.

In January 1928, desiring to round out steel making operations, the company settled upon a program which involved, as the principal outlet for increased tonnage, the manufacture of wire and wire products. The Morgan Construction Company were commissioned as consulting engineers to carry the program into effect.

Rod Mill Equipment

Raw material for the wire mill is supplied by two new Morgan mills, a four stand 18″ billet mill and a seventeen stand 10″ rod mill, the latter being of somewhat unusual design in that local conditions required the mill to be folded back so as to deliver rods toward the heating furnace. It is a combination rod and merchant bar mill and is provided with a cooling bed which is capable of receiving bars from either end, and which serves the new mill and an existing bar mill. The mill rolls thirty foot 2″ square billets to 400 pound bundles of rod of No. 5 gauge and coarser. Wire rods delivered from the reels pass through a covered conveyor about 250 feet long.

Rods delivered at the end of a conveyor are transferred by telegraph hook onto the arms of two "star wheels" each arm carrying eight 400 pound bundles. A power operated hairpin hook removes rod bundles in 3,200 pound lifts from the star wheels and delivers these rod bundles either into storage or direct to the cleaning house.

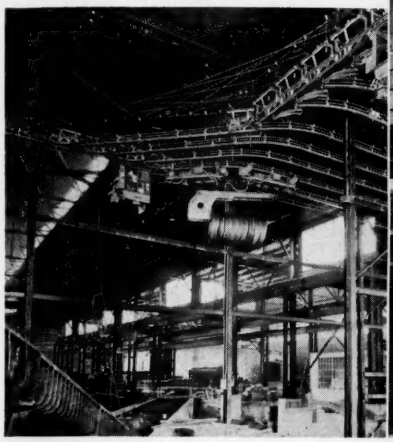
The hairpin unit leaving the rod storage building crosses Independence Road at an elevation of thirty-two feet, runs along the side of the wire mill and enters the cleaning house at high level. Here the load is set down on one of three transfer trucks running on rails.

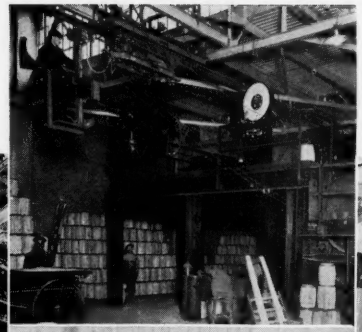
Cleaning House

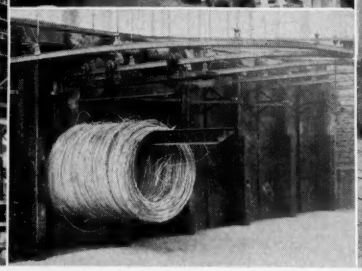
The cleaning house is of the straight line type with rectangular masonry tubs served by a single-leg gantry crane. The north rail is a high rail suspended from the super-structure and as the acid proof cleaning

Below—A power operated hairpin hook carrying 3200-pound loads of rod conveys them from the storage building by tramrail to the cleaning house across the street.

Center—The loaded hook passes into one of the sixty-foot alleys of the baker by gravity. The doors are automatically opened for it by attachments on the hook.

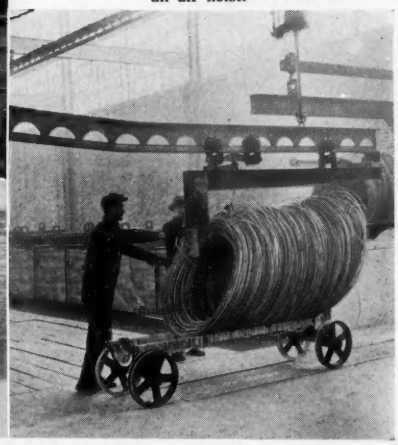






Top—The carrier sets down the nail buggies on the elevated platform at the rumblers, passing over a tramrail scale in transit and recording the weight.

Below—Lime coated rods ready for baking are lifted by a hairpin hook in a section of the tramrail hinged for vertical movement and commanded by an air hoist.



hooks present their open end to this side of the building, the transfer trucks can place the rods onto the hook when the crane is properly spotted for this operation. This transfer is a hand job with provision for motorizing in the future. The hooks used in the cleaning house are suspended at two points and have therefore neither swivel nor tilt motion.

The cleaning tub is a concrete vat 104 feet long, at the east end of which four acid tubs are partitioned off in brick, each tub holding two 3,200 pound loads of rod. Beyond the brickwork are the steel tanks for water and lime and the sulling space, all commanded by the same gantry crane. North of the cleaning house is a service department with storage for burnt lime, and with slacking trays at mill floor level, and, on basement level, storage and seasoning vats for slacked lime, boiler, compressor, etc. Acid is delivered by gravity from a storage tank outside the building to a lead lined measuring tank, from which it is valved to the various cleaning vats.

Baker

Cleaned, sulled and lime coated rods coming out the lime tub are dropped onto a transfer truck which moves forward on rails about ten feet for transfer of rods onto the tramrail system of the baker and wire mill. There is at this point a section in the tramrail hinged for vertical movement, commanded by an air hoist. A hairpin hook made of welded structural steel, of which there are eighty in service, runs down the hinged section and enters the coils. By means of the air hoist the hinged section is raised quickly to its upper position and the loaded hook with no other aid than gravity, passes into the baker, whose doors are automatically opened for its passage by attachments on the hook.

Inside the baker, which has six alleys sixty feet in length, the tramrail is suspended from the baker roof structure and has sufficient pitch to insure automatic operation. At the exit end a braking device mounted in the tramrail structure brings the load to a gradual stop and is of such design that through the operation of pendent switch handles on the wire mill side, alleys can be emptied either completely or one hook at a time. The baker is heated by natural gas passing through ribbed semi-cylindrical cast iron flues beneath the rods and is ventilated by natural draft through the roof panels. Automatic regulating sets maintain the alleys at uniform temperature.

Wire Mill

Baked rods carried on the steel hooks in 3,200 pound units are pushed by hand from the baker to overhead tracks along the south side of the wire mill where trackage is provided for

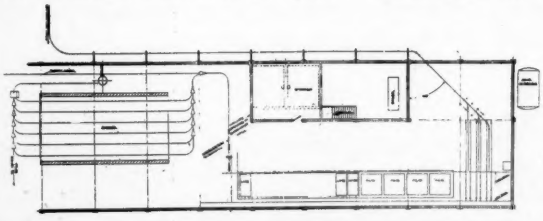


Fig. 2—Floor plan of cleaning house showing location of acid tubs, storage space for lime, boiler, compressor, etc. Acid is stored in the outdoor tank. Rods pass from the bakers at the left to the wire mill.

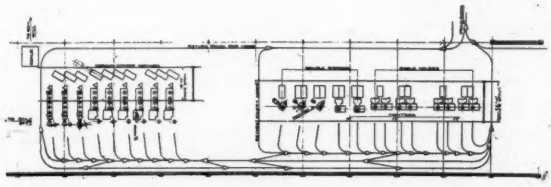


Fig. 3—Floor plan showing location of wire drawing units grouped for tramrail service. There are eight single draft blocks and five double-deck blocks, each unit having an individual motor.

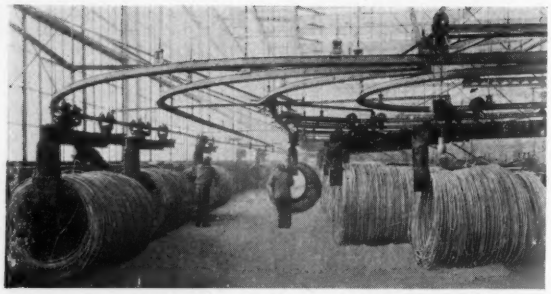


Fig. 4—Six continuous Morgan-Connor wire drawing machines are arranged for either three, four, or five-draft work, and three for four, five or six-draft work. A control tunnel runs the length of the wire mill.

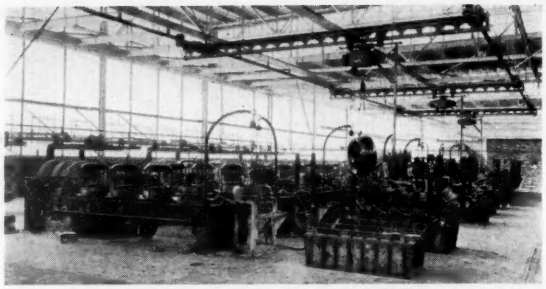


Fig. 5—Baked rods carried on the steel hooks in 3200-pound units are pushed by hand from the baker to overhead tracks along the south side of the wire mill. Here trackage is provided for storage, classification and switching.

storage, classification and switching.

Drawing Equipment

Wire drawing equipment consists of continuous wire machines, double-deck blocks and single draft blocks. Of the continuous machines there are nine, six being arranged for either three, four or five draft work and three being arranged for four, five or six draft work. Of double-deck blocks there are five, each direct motor connected. There are eight single draft blocks with individual motors. A control tunnel runs the length of the wire mill just south of the wire drawing units. On the tunnel wall are mounted the magnetic control panels.

Each wire drawing unit has its own track of sufficient length to carry a loaded hook. Rods are switched in from the storage track by hand and appliances are attached to the hooks which permit their use as flippers so that eight 400 pound bundles are flipped direct to the first die without other handling.

In recognition of the fact that in order to take full advantage of the handling economies inherent in large rod bundles, there should be a complete separation of raw and finished material, equipment and layout were so arranged that there should be normally no backward movement of material that had passed through a die. In the case of continuous machines this arrangement is of course inherent. In the double-decking and single draft units spacing has been such as to permit the stripping and loading of finished wire on the back side of the drawing equipment. The stripping cranes cover space on the back instead of the front of the drawing units. To take care of emergencies and of disturbances in normal schedule, these stripping cranes are permitted to cover a few feet at the front of the blocks so that process wire can be dumped onto reels and multi-draft work handled on these units.

The stripping cranes load finished wire in 400 pound bundles onto pressed steel skid platforms on which are mounted standard truck bodies. These loaded skids are distributed by a gasoline truck of the low lift type, passing over the platform scale and going either to the nail mill or to the galvanizing department.

Nail Mill

A feature of this plant is the handling of wire in four hundred pound units throughout every operation. The nail mill was laid out carefully with this in view. The machines are arranged in two rows facing a central aisle. Back of the machines are parked the loaded wire skids and the transfer of bundles to the reels is by traveling crane and mechanical hoist. The center aisle is commanded by a mono-rail carrier by means of which the operator riding overhead can pick up any nail buggy spotted on the center line. The carrier sets down the nail buggies on the elevated platform at the rumblers, passing over a tramrail scale in transit and recording the weights. The cab clears the rumbler platform by only a few inches so that the operator can conveniently dismount to park the nail buggies and fill the rumblers.

The rumblers, which are of thirty keg capacity, are of the hexagon type made of welded steel plates. By means of hinged butterfly valves, sawdust and whiskers are shunted to the sawdust bin behind the rumblers and nails can be dumped directly onto the sorting plate. The usual keg shakers are provided.

A novel feature of these rumblers is that the hexagon shells have no trunions or gears. There is mounted on each shell two large steel tires which rest on two sets of chilled iron rocker wheels through which the rumbler is driven by friction. Each rumbler has its own motor of which the push button control as well as the brake and the butterfly lever are mounted on an operating platform at a convenient level above the sorting plate.

A sawdust bin of two-carload capacity is mounted on the roof trusses and discharges on the rumbler platform.

Galvanizing

The continuous annealing furnace serving the galvanizing unit is of the two-pass type and arranged for thirty-six wires It is of open chamber design burning natural gas. The acid and fluxing tanks are enclosed in a wooden structure and the fumes vented through the roof. The take-up frame is divided into three 12-block units, each with adjustable speed motor drive. Blocks are of 28", 22" and 16" and are of sufficient

(*Please turn to page 174*)

Grooved vs. Round Nails

Government engineers report on relative values brought out by Forest Products Laboratory tests

By L. J. Markwardt and J. M. Gahagan
Forest Service, U. S. Department of Agriculture

DURING the past year one of the studies carried out by the Forest Products Laboratory of the Department of Agriculture in cooperation with the National Committee on Wood Utilization of the Department of Commerce was a test of grooved nails, which were furnished by the Committee and included in a general nail-holding study under way at the Laboratory.

The nail-holding properties of wood, and the influence of such factors as species, time, moisture condition and changes in moisture have long been under consideration and study at the Forest Products Laboratory because of their significance in the use of wood. Efforts have been made from time to time to improve wooden construction by changing the form of the nail or its surface condition.

The grooved nail is one of the most interesting of the various forms studied. The results have shown that it has certain definite advantages, but the data so far obtained are not adequate to permit a definite appraisal of the effect of time and moisture changes in the wood on its efficiency, both of which are important factors in use.

Shape and Size of the Nails

The grooved nail approximates a square in cross section but has rounded corners, and as the name implies, each of its four faces or sides has a vertical groove along the center that extends throughout the length of the nail shank. (Fig. 1.) These nails were compared with 7d plain round nails, which were used as controls in tests made to determine their relative resistance to withdrawal under different conditions. The two types of nails, while of approximately the same size, are not identical in cross-sectional area, perimeter, surface of contact, or weight.

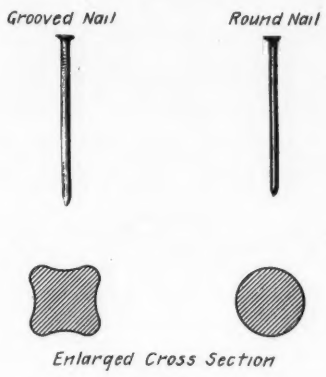


Fig. 1 Types of nails studied

Adjustment Factors

Adjustment factors based on surface area were applied to the results of the tests in order to compensate for the differences in shape and size, since in general the holding power of nails has been found to vary with area of surface contact.

The adjustment factor for area of surface contact is the ratio of the area of contact of the round to that of the grooved nail. To get the area of contact of the grooved nail, it was necessary to measure rather than compute the perimeter. The measurements were taken on sections which had been photographically enlarged. The cross-sectional area was also obtained from these enlarged photographs by means of a planimeter.

The adjustment factor for weight was obtained by taking the ratios of the square roots of the weights of equal lengths of both types of nails. This is the same as the ratio of the square roots of the cross-sectional areas, except for a small difference due to experimental error in measuring the area of the grooved nail. A direct ratio can not be used since nails of small diameter have greater area of contact per unit weight than those of large diameter.

Method of Test

The tests used in the study were limited to a determination of the static force required to withdraw the nails, the maximum load in pounds being recorded. A testing machine equipped with a special gripping device was used in pulling the nails. The method of test is shown in Fig. 2.

Scope of Study

Five series of tests were made on the round and grooved nails. The first series had as its object the determination of the holding power of the two types of nails with original surfaces. The purpose of the other four series was to determine the effect of surface conditions on holding power. Descriptions of the five series follow:

Series 1

Both types of nails were driven into side and end surfaces

Table 3.—Specifications of Nails

Kind of nail	Size of nail	Weight of 1-½ inches measured from pointed end	Diameter	Area of cross section	Perimeter
		Grams	Inches	Sq. in.	Inches
Round	7d	1.410	0.0988	0.00763	0.310
Grooved	.....	1.548	.....	0.00854	0.361

of green and air-seasoned specimens of western yellow pine. Some of the nails were pulled immediately after driving, some after the wood had seasoned 40 days and some after about 100 days seasoning.

Series 2

Grooved nails were first machine-polished, then driven into side grain surfaces of air-seasoned specimens of western yellow pine and then pulled immediately.

Series 3

Nails of both types were nickel-plated and tested as in Series 2.

Series 4

Nails of both types were machine-polished and then tested as in Series 2.

Series 5

Same as Series 4 except that additional nails of both types were also tested as taken from the original packages.

Explanation of Tables

The results of the first series of tests show that, when both types of nails were pulled immediately after driving, the grooved nail required a greater average pulling force than the round nail. Even when reduced to equal area of contact, the average force required to pull the grooved nail was from 17 to 35 per cent greater than for the round nail.

On the basis of equal weight and length, the grooved nail had from 30 to 50 per cent higher average holding power. However, both types of nails when pulled after having been driven into green wood that was subsequently allowed to season, differed much less in their holding power; and when driven into air-dry wood and allowed to stand several months before pulling, the round nail actually exceeded the grooved nail in resistance to withdrawal.

The large difference in holding power of the two types of nails when driven and pulled immediately, raises the question, "How much of this improvement is due to the form of the grooved nail?" On the assumption that the holding power of a nail varies according to the area of contact, one would expect the

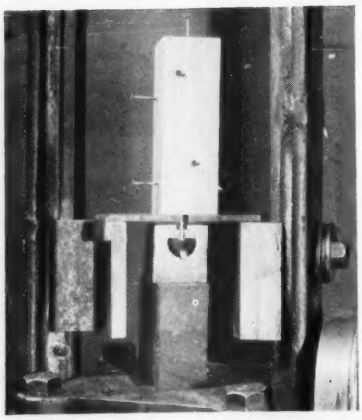


Fig. 2 A testing machine equipped with a special gripping device was used in pulling the nails. It recorded the static force required to withdraw them in terms of maximum load in pounds.

grooved nail to hold only 10 per cent more than a round nail of equal weight and length since its perimeter would be only 10 per cent greater.

In order to determine the effect of factors other than form, which might account in part for the large difference in holding power between the two types of nails, test series 2, 3, 4 and 5 were run. It may be seen from the results of these tests that polishing *reduced* the holding power of the grooved nail an average of about 10 per cent, and under Series 5 that it *increased* the holding power of the plain, round nail approximately 6 per cent.

Advantages of Both Types

These figures show that both types of nails when tested as originally received by the Forest Products Laboratory had surface conditions which resulted in approximately 16 per cent of the difference for their average holding power when driven and pulled at once. However, taking into account this effect of surface condition, the grooved nail when driven and pulled at once had a higher average holding power than the plain round nail of equal weight and length, although there is but little difference between the two when their areas of contact are the same.

The results for Series 1 when adjusted for the difference caused by surface coating, show very much the same relation in holding power that appears for nickel-plated and polished nails of both types.

Conclusions

It appears from the tests that the form of a grooved nail gives it an increased resistance to immediate withdrawal of approximately 10 per cent over that of a plain round nail of equal weight and length, but there is little difference between the two types of nails when their areas of surface contact are equal. On the other hand, there is an apparent reversal in the holding power of the two types of nails when they are pulled several months after having been driven.

It may be that a round nail is actually better under these conditions or it may be that the apparent difference is caused by such factors as the species of wood used or the temporary surface condition of the nail. The permanence in holding power is exceedingly important since there are but few uses where the time element does not enter.

Other Factors Enter

There are, of course, other factors in addition to holding power to be considered in judging the relative utility of the two types of nails, such as ease of handling, tendency to split the wood in driving, and stiffness which facilitates driving and which often determines the size of nail required for a particular use. No study has been made on any of these factors in connection with the grooved nail, but it has been observed that this type of nail is somewhat less inclined to split the wood than a plain round nail, and its form also gives it at least 5 per cent greater stiffness for equal weight and length.

Although no cement-coated nails were included in this study there seems to be no adequate reason why a grooved nail would not be improved as well as a round nail by such a coating.

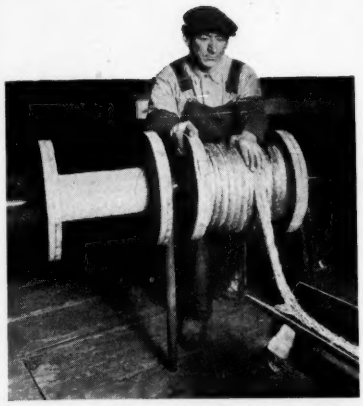
A more definite estimate of the efficiency of the grooved nail would involve further tests, particularly those that would bring out more conclusively the effect of time and the effect of properties other than resistance to withdrawal.

Lead Wool in the Making

Rope formed from extruded strands is a comparatively new metal product that is finding a broadening market

By Sidney R. Gill

Northwest Lead Company, Seattle, Washington



Spooling lead wool preparatory to shipment. The reel is being filled from the trough that delivers compressed rope made by dropping the strands from a height of twenty feet.

LEAD Wool is a product relatively young in the lead industry. The use of lead itself is related in Biblical history and became quite prominent as an art when the Roman Empire was proudly displaying its power to the then-known world. Its use in that period, however, was confined almost entirely to lead sheets and lead pipe.

In the last century lead has found itself utilized in ways too numerous to mention. It commands fourth place amongst all other metals in the building industry and today plumbing, electricity and all modern machinery are dependent upon it.

Lead Wool is an important product of lead. Although its use was discovered but a few years ago, hundreds of tons are now being used annually in many fields. Its manufacture is comparatively simple in principle, but there are several features which must be carefully experimented with before a perfect product results.

Hot Process Used

Lead is melted in an insulated melting pot, fitted at its base with an adjustable spout and steel die. This pot is heated by a series of gas flames placed in the interior of the insulating jacket, from the top of the pot, where the heat is minimized, to the outlet spout where the heat is increased, thus providing an even temperature of the entire lead content. This feature is an important one. The melting point of lead is 620° F. but it is necessary to increase the heat of the die in order that the lead will flow readily and in continuous lengths. Improperly heated, the wool either becomes coarse and uneven or extrudes in short lengths and cannot attain the essential perfection.

As a double safeguard to insure an even temperature at all times, the two melting pots are used and the supply of molten metal in the main pot is replenished—not with cold pigs of lead only—but also with lead already melted to the proper heat in the adjoining pot. This accounts for the invariable evenness in the product.

Rope Formed Automatically

After securing the exact temperature required, the molten lead is released and forced by its own weight through a perforated die, which has much the appearance of a seive. A separate heating unit is provided for this die, as stated above, to again insure uniform heat and to avoid its clogging.

A stack of lead wool on wooden reels ready for shipment. In addition to its use in plumbing and in calking joints on gas and water lines it is extensively employed in oil well operations to eliminate seepage of water.

The hundreds of holes in this seive are exceedingly minute in size. A No. 80 drill is used for perforating only part way through the die and the hole is completed by using the point of an ordinary small needle.

The lead wool strands are cooled and solidified by using an air fan, placed immediately below the die. The spray of shredded lead is dropped approximately 20 feet through the air into a smooth metal trough, which is tapered at the lower end, thus bringing the lead wool into rope form automatically. To compress this rope for spooling and sacking, a "packing" machine pummels the rope into still more compact form and it is then carried to the end of the trough where it is prepared for shipment.

The "packing" machine referred to is an ingenious device perfected in the Northwest Lead Company Plant and its operation may be likened to an old fashioned grain beater, which it readily suggests when seen in operation. This "packer" compresses every inch of the lead rope without kinking or breaking the fine strands as they come together.

Uses of Lead Wool

Lead wool is principally used by gas companies, water companies and plumbers for calking pipe joints. It is superior to molten lead, cement and liquid materials, in that it requires no heating, stirring, banding of joints, or pouring and consequently eliminates the usual paraphernalia that ordinarily accompanies the workman on his calking job. A further saving

(*Please turn to page 173*)

Poultry Men Find New Wire Uses

Application of wire to floors as well as side walls of new style housing equipment results in healthier chicks

By Carl H. Schroeder

Reprinted From Poultry Tribune

THAT chicks can be raised successfully and profitably "off" the soil—in confinement—has become a well established fact. Although the confinement system has proved a decided factor in coping with diseases and infestations resulting from contaminated ground, its efficiency to the fullest degree is not attained unless wire floors replace the litter. Wire floors diminish, as far as is humanly possible, the danger of infection and re-infection through the droppings.

The success which battery brooders have scored is largely founded upon the results of improved sanitation incident to the use of wire floors. The use of such wire floors is not only confined to batteries; it can be used with equally good results in any poultry house used for brooders or for growing chicks. Thousands of chicks raised in batteries, or in houses equipped with wire floors, have consistently proved the wisdom of such practice.

The accompanying photographs illustrate two types of wire floors. The sectional wire floor in the colony brooder house is more economical in construction and better suited under usual conditions. The sectional frame consists of one-inch lumber, about five inches high. The top edges are beveled. For chicks up to ten weeks of age, one-half inch mesh (galvanized hardware cloth) is used, 19 or —better still—16 gauge. After the chicks are ten to twelve weeks old, the ordinary three-fourths inch, diamond mesh poultry netting of a heavy gauge, galvanized after weaving, will well serve the purpose.

No litter of any kind is needed, but it is good practice to cover the floor with a layer of peat-moss, finely-cut straw, chaff or sand (to facilitate cleaning) before putting down the wire sections. Houses with wire floors require less frequent cleaning. Of course, chicks on wire floors should not be given range. The access to contaminated yards would defeat the purpose of

(*Please turn to page 175*)

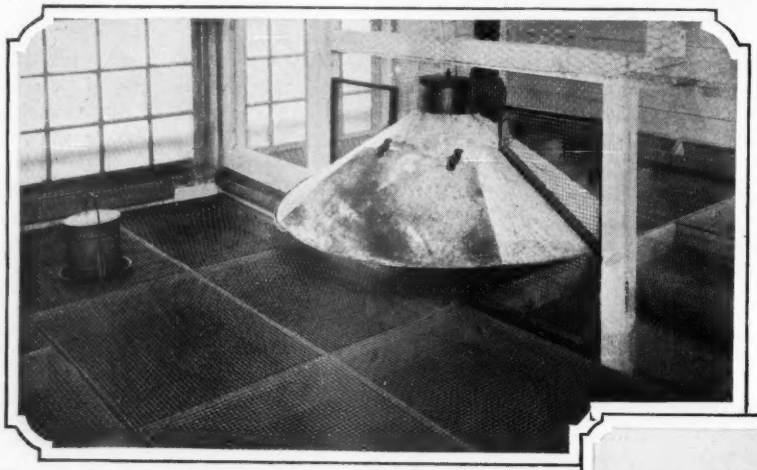


Fig. 1 — Colony brooder house with raised section floor made of 16-gauge galvanized hardware cloth. One-half and three-fourths inch diamond mesh are the recommended sizes.

Fig. 2—The structure below is a view of the exterior of the same brooder house showing a fly-proof run parlor also equipped with the wire floor.

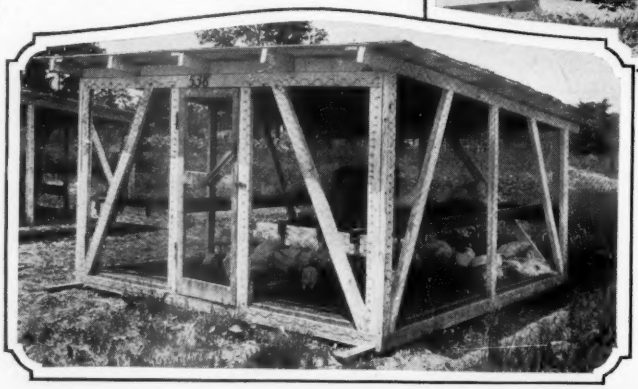


Fig. 3 — On many farms in intensive poultry production centers, chicks are raised to maturity without ever leaving their wire-floored houses. This summer house shelters chicks old enough to leave the colony brooder houses.

DIGEST *of* RECENT TRADE LITERATURE

The Deterioration of Colliery Winding Ropes in Service. Wire Ropes Committee, British Safety in Mines Research Board, London, England.

As part of the Committee's research program, a specimen is examined from practically every colliery winding rope which fails in service. The information so acquired is supplemented by examination of specimens cut off winding ropes at recapping. This report gives descriptions of a number of typical failures and discusses the factors that operated to cause the deterioration of the ropes. The examinations, which were carried out at the Imperial College of Science and Technology, London, showed three influences at work—failure of the metal under repeated stress (fatigue), wear, and corrosion. Failures are seldom attributable to one of these influences alone, but are frequently the result of simultaneous operation of two or more.

Fatigue or failure by slow fracture was found to be the most common influence. It also appeared to be the most dangerous because of the uncertainty in its incidence, depending as it does on the effects of kinetic shock stresses and on the resistance of cold drawn wire to repeated stress. Little is at present known about these two matters, but they are important subjects included in the program of investigations. The examination, in addition to proving the necessity for recapping at short intetrvals, showed the advisability of cutting off several feet of rope at each recapping and emphasized the importance of careful examination of the portion cut off to ascertain its internal condition as an indication of the possible conditions existing elsewhere in the rope. The presence of broken wires in the interior of the piece of rope cut off at recapping is a danger signal. In the experience of the authors of the report ropes which fail seldom show broken wires on the surface before fracture.

Management Training for Engineers. The Journal of Engineering Education. P. 350. December, 1928.

The biggest problem in industry today is still efficient production, not distribution, and will be for some years to come. That is why industrial management is more and more frequently being turned over to the engineer. The specialized executive becomes the general managing executive with increasing frequency. The engineer is being drawn from technical practice to become involved in purely administrative functions for which he must be equipped by a new kind of preparation.

Keeping Machines and Power on the Job. Manufacturing Industries, December, 1928. P. 579.

The plant engineer of the Cadillac Motor Company describes methods by which 2,800 machines were moved during the year, 1000 plant betterments handled in two weeks, maintenance costs reduced and interruptions to production cut down. An organization chart shows the make-up of the plant engineer's department.

Trade Literature Received

Factory Equipment

"Steel Factory Equipment". The Pollard Bros. Mfg. Co., 4034-36 N. Tripp Ave., Chicago, Ill. 24 pages. Illustrated. Catalogue of steel benches and bench legs, tool stands and boxes, stools, shop desks, light and heavy duty factory trucks, etc. Equipment illustrated includes Bar Stock Racks, single and double arm type, with capacities of ten to fifteen tons.

Screw Machines

"Motor Driven Wire Feed Screws Machines". Brown & Sharpe Mfg. Co., Providence, R. I. 4 pages. Illustrated. Features machines suitable for the producer of small job lots of screws, studs and other turned parts requiring simplicity of control and flexibility of operation. There are also illustrations and specifications of the company's complete line of wire feed screw machines for both belt and motor drive.

Condulets

"Condulets." Crouse-Hinds Company, Syracuse, New York. 714 pages. A very comprehensive catalogue and reference book, bound in flexible covers and thumb indexed, describing the company's complete line of wiring devices, including galvanized condulets, condulet covers, gaskets, attachment plugs and lamp receptacles, self-threading connectors, unions, branch extensions, adapters, etc. There are several pages of engineering data, diagrams and dimensions.

Cable Machinery

"Wire Rope and Cable Making Machinery". George Crossley Limited, Albion Iron Works, Checkheaton, Yorkshire, England. 42 pages. Illustrated. Catalogue of winding, stranding, closing and armoring machinery and equipment for complete wire drawing plant installations.

Wire Guards

"Steelcrete Frame Bar Window Guards". The Consilidated Expanded Metal Companies, Wheeling, W. Va. 16 pages. Illustrated. A catalogue of diamond mesh wire and fly screen window, door, transom and sky-light guards and combination railings. Methods of hanging and locking are also illustrated.

NEWS *of the* INDUSTRY

Foreign Trade Opportunities

FOREIGN trade opportunities reported by the U. S. Bureau of Foreign and Domestic Commerce during the month of April include inquiries from the following sources: For wood screws (37351) from Santo Domingo, Dominican Republic; for wire and barbed wire (37351) from the same inquirer; for wire forming, cutting and straightening machinery, especially for drawing wire from pig iron (37467) from Piraeus, Greece; for wiring supplies except wire (37496) from Barcelona, Spain; for fencing material (37606) from Sydney, Australia; for fly roller screen (37606) from the same inquirer; for wood screws (37570) from Karachi, India; for nail counting machines (37560) from Helsingfors, Finland; for nail cutting machinery (37615) from Valparaiso, Chile; for bright copper wire (37753) from Lucerne, Switzerland; for wiring supplies and lighting fixtures (37750) from Winnipeg, Canada; for wire and wire products (37816) from Winnipeg, Canada; for bird cages (37864) from Habana, Cuba, for insulating cambric, varnished, (38077) from Bombay, India, electric wiring supplies (38082) from Bombay, India; wire nails (37958) from Magallanes, Chile; barbed wire (37982) from Maracaibo, Venezuela; barbed and plain galvanized wire (37957) from Buenos Aires, Argentina; heavy wire fencing, (37979) 2,500 yards, from Cartagena, Colombia.

Trade Lists Available

THE Commercial Intelligence Division of the Bureau of Foreign and Domestic Commerce has recently compiled three foreign trade lists mimeographed copies of which may be obtained from the Bureau or its district or cooperative offices by referring to the titles and file numbers here given. One is a revised list of importers and dealers of hardware and allied lines in Peru (LA-20721), the other a revised list of importers and dealers in iron and steel in the Philippine Islands (FE-25771), and the third a revised list of electrical equipment importers and dealers in Canada (BE-1681).

A notification of the Government of India dated February 9, 1929, exempts from payment of the import duty of 15 per cent ad valorem, insulated copper cables containing pilot cores (but no power cores) of a sectional area of less than one-eightieth part of a square inch.

An Executive decree, dated February 25, reduced the San Salvadoran import duty on untempered iron or steel wire, black, galvanized or tinned, up to nine-tenths of a millimeter in diameter, from $51.40 to $5 per hundred kilos. This rate of duty includes all surtaxes.

To Investigate Wire Rope

A COOPERATIVE investigation of the properties and use of wire rope is being urged by representative manufacturers and users of this product to be conducted under the auspices of the American Society of Mechanical Engineers Main Research Committee. There appear to be no well substantiated facts on which to protect the life of this widely used material or to establish standards for its use. In order that there may be no risk of failure, therefore, thousands of feet of wire rope are discarded each year long before its useful life is completed. Greater knowledge of the material is apparently needed and would, it is felt, bring about increased use for wire rope as well as greater satisfaction to the user.

Screw Standards Approved

A PROPOSED American standard for slotted-head proportions for machine, cap and wood screws has been approved by the Sectional Committe on the standardization of Bolt, Nut and Rivet Proportions representing the joint sponsorship of the Society of Automotive Engineers and the American Society of Mechanical Engineers. A copy of the complete report may be had from Mr. C. B. LePage, Assistant Secretary, A. S. M. E., 29 W. 39th St., N. Y. C.

Whitcomb Joins Scott Company

THE Henry L. Scott Company, Providence, R. I., makers of testing machines, announces the addition to their organization of the well-known scientist, Mr. William H. Whitcomb. Mr. Whitcomb comes to the Scott staff after 12 years spent as Director of Central Laboratory in the Footwear Division of the U. S. Rubber Company at New Haven, Connecticut.

Mr. Whitcomb's academic degrees and periods of tutoring are very extensive. He took an S. S. (1903) at Massachusetts Institute of Technology, later an M. S. (1906) at the same seat of learning, graduated from Harvard in 1912, was appointed and occupied the chair as assistant in Physics and Electro Chemistry at M. I. T. in 1903 and 1904, Assistant in Physics at the same college during the period 1905-1906, was Assistant Professor of Chemistry at Miami University, Oxford, Ohio, during 1906 to 1910, later appointed Associate Professor in the same course at the same college 1910-1913 and becoming Professor from 1913 to 1917. He is also a member of the American Chemical Society, American Society

for Testing Materials, and Committee D-13 on Textile materials.

The Henry L. Scott Company feels that the addition of Mr. Whitcomb will enable them to render an even more comprehensive scientific and advisory service to their long list of present clients and to those who may become clients in the future. The personal services of Mr. Whitcomb are available to all.

Steel & Wire Co. Changes

American Steel & Wire Co. announce a number of changes in personnel made effective during the past month. Henry A. Barren, who became general superintendent in 1924, has resigned as vice president in charge of operations. His successor is C. F. Blackmer, formerly superintendent of wire mills, whose headquarters will remain in Cleveland. Henry A. Squibbs, formerly sales manager of the fence department, has been appointed general sales manager at Chicago. J. C. Hopkins, who has been superintendent of the Central furnaces in Cleveland, has been appointed general superintendent of blast furnaces and steel works. J. B. Clark, general superintendent of the Donora steel works, retires on pension May 1 after twenty-five years' service with the company. He is to be succeeded by A. F. White, now assistant superintendent.

Obituary

Frank B. Toombs, general sales manager, treasurer, and member of the board of the Chicago Steel & Wire Co., Chicago, died April 15, at the age of thirty-six. Mr. Toombs has been identified with the company since its organization in 1914.

Building and Expansion

Sirian Wire & Contact Co., Newark, N. J., manufacturers of wire for lamp bulbs and radio tubes, has purchased a plant on Sherman Avenue. Company is affiliated with Arcturus Radio Co. at the same address.

COMING EVENTS

May 6-11. Chemical Show. Grand Central Palace, New York City. International Exposition Company; F. W. Payne, President.

May 16-17. National Hardware Association of the United States Annual meeting of metal branch, Hotel Statler, Detroit. George A. Fernley, Secretary, 505 Arch Street, Philadelphia.

May 21-23. American Steel and Heavy Hardware Association. Twentieth annual convention, Hotel Washington, Washington. Secretary, B. R. Sackett, 503 Arch Street, Philadelphia.

May 7. International Exposition. Seville, Spain. Hon. Thomas E. Campbell, U. S. Commissioner.

May 27-30. Third National Aeronautic meeting, American Society of Mechanical Engineers at St. Louis. Calvin W. Rice, Secretary, 29 W. 39th St., New York City.

June 3-6. National Assn. of Purchasing Agents at Buffalo. Secretary, George A. Renard, 11 Park Place, New York.

June 5-7. Canadian Electric Railway Assn. at Montreal. Secretary, E. Smith, Jr., 35 Yonge St., Toronto.

June 17-22. Twenty-fifth Annual Iron and Steel Exposition. William Penn Hotel, Pittsburgh, Pa.

June 24-28. Annual meeting, American Society for Testing Materials, Chalfonte Haddon Hall Hotel, Atlantic City, N. J. C. L. Warwick, Secretary, 1315 Spruce St., Philadelphia.

July 1-4. Summer meeting, American Society of Mechanical Engineers at Salt Lake City, Utah. Calvin W. Rice, Secretary, 29 W. 39th St., New York City.

July 8-11. Annual Convention, American Electro Platers' Society, at Detroit, Mich.

General Plate Co., Attleboro, Mass., manufacturers of jewelry wire, is building additional plant facilities at an estimated cost of $50,000.

Metal Textile Corporation, West Orange, N. J., manufacturers of wire cloth fabric specialties for culinary cleaning purposes has been reorganized and will offer a new stock issue to finance expansion.

Union Cap Screw Co., Union Avenue, Cleveland, Ohio, will build an addition to its plant at that address.

Master Wire Lathe Co., Los Angeles, California, manufacturers of woven wire lath, has been organized to succeed Master Metalath Mfg. Co. A new plant has been recently completed.

Anaconda Wire & Cable Co., New York City, has purchased the Tubular Woven Fabric Co. of Pawtucket, R. I., and will also take over Maring Wire Co. of Muskegon, Mich., and Anderson, Ind.

Beaver Mfg. Co., Newark, N. J., manufacturers of electrical wiring devices and equipment, will build a two-story factory addition at an estimated cost of about $40,000 with equipment.

Newark Galvanizing Co., Newark, N. J., has opened a new plant for hot-dip galvanizing at 39 Verona Avenue, the address of the Atlas Fence Co. of which it is a subsidiary.

Washburn Wire Works, East Providence, R. I., will build and equip an additional factory building at an estimated cost of $25,000.

Allis Automatic Screw Products Co., West Allis, Milwaukee, will build a one-story addition to its present plant to provide for expansion.

National Umbrella Frame Co., manufacturers of umbrella wire and lock washers, has removed its general offices from Philadelphia to Penn and Belfield Streets, Germantown, Penna.

Thompson Wire Co., Worcester, Mass., will build and equip a new plant unit at an estimated cost of $25,000.

Polymet Manufacturing Company, which recently acquired the entire capital stock of the Strand & Sweet Mfg. Corp. of Winsted, Conn., is considering plans for the enlargement of the plant now devoted to making fine sizes of wire used by the radio and electrical industries.

Sleeper & Hartley TRADE MARK

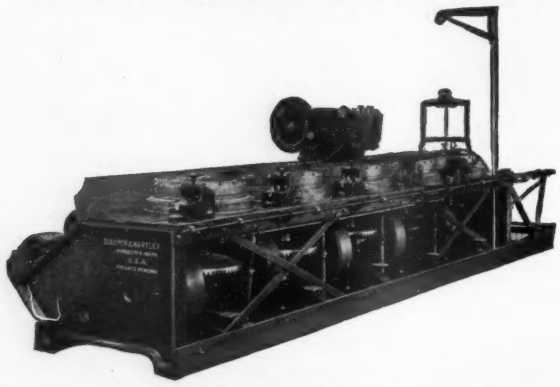
Practical Continuous Wire

These Machines Go Into Production at (...—F...

Rod Frame

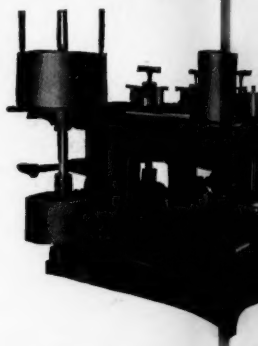
(No. 5—14 or 15 wire)
Patented June 3, 1924—May 12, 1925—others pending

All Ball or Roller Bearings
No Differential Gearing.
Automatic Compensation for Speeds of Heads.

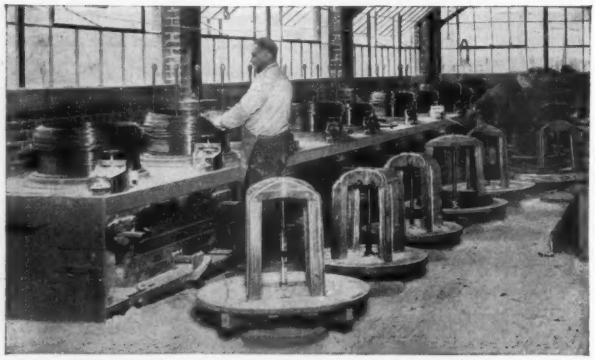


Double 5-Draft ...y,

No. 14 to No. 23. ... or ...
3 to 4 Blocks to ...rag...
No. 14 to 19—4 h... 400
No. 14 to 20—5 h... 100
More than 270 heads of th... prov...

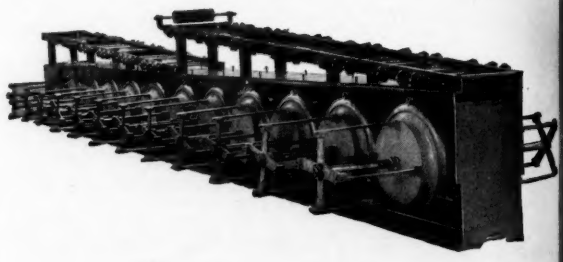


IMPROVED WIRE MILL EQUIP...E...



Standard Rod Frame—10 Block

Long, Stiff Spindles, in anti-friction bearings, and equipped with friction Clutches. Powerful and reliable.
Practically noiseless in operation.
(New Plant of Thompson Wire Co., Worcester, Mass.)



Patenting Furnace Take-Up

(New Plant of Thompson Wire Co., Worcester, Mass.)

AGENTS: CHICAGO TERRITORY, Neff, Kohlbusch & Bissell, Inc.
SAN FRANCISCO AND LOS ANGELES L. G. Henes Machinery Company

SLEEPER & ...A...

FOREIGN AGENTS AND REPRESENTATIVES: UNITED KINGDOM—Mr. Fredk. A. Perry, 63 Queen Victoria St., London, E. C. 4.
FRANCE—Mr. Edgar Bloxham, 12 Rue du Delta, Paris.
MONTREAL AND TORONTO—Arthur Jackson Machine Tool Co.

WORCESTER...MA...

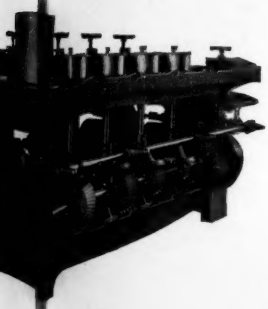
Wire Drawing Machinery

Sleeper & Hartley TRADEMARK

—Reducing Overhead—Increasing Production!!

Draftsy, Intermediate

23. For low carbon wire.
6 Blocks to Average Operator.
4 h 400 lbs. per block.
5 h 100 lbs. per block.
ds of the proved model in operation

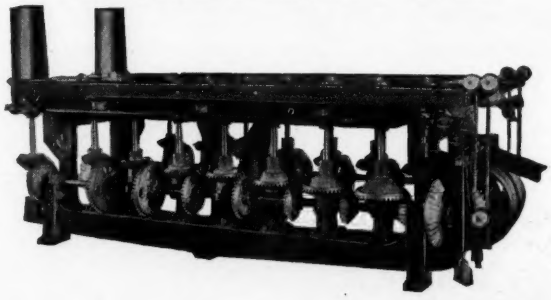


Double 8-Draft Fine Wire: Wet

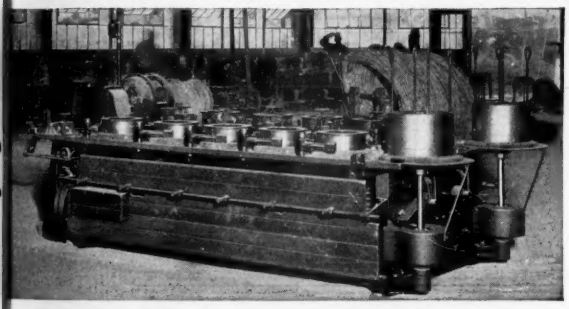
No. 22 to 36. High or low carbon wire.

6 Blocks to Average Operator, 22-33, 8-hole, 660 lbs. per day of ten hours.

Many thousands of these heads in operation



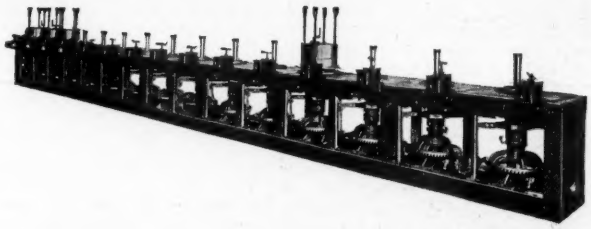
EQUIPMENT RECENTLY INSTALLED



Double Six-Draft Dry Continuous For High Carbon Wire

Direct driven with silent chain. Cut gears throughout. Anti-friction bearings. Variable speed for finishing block.

(New Plant of Thompson Wire Co., Worcester, Mass.)



Heavy 16" Frame For .65 Carbon Wire No. 10½ to .037"

15 Blocks: Motor driven. Silent chain. Anti friction bearings and cut gears throughout.

(New Plant of Johnson Steel & Wire Co., Worcester, Mass.)

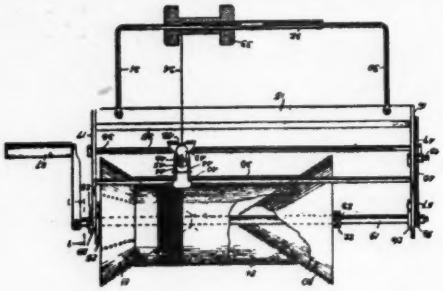
& HARTLEY, Inc.

Agents: Philadelphia Territory
Swind Machinery Co.

ITALY—Henry Coe & Clerici, Milan. AUSTRALIA AND NEW ZEALAND—Edwin Wood Pty., Ltd., Melbourne.
JAPAN—Andrews & George Co., Tokyo. SWEDEN AN D FINLAND—Maskinaktiebolaget Karlebo, Stockholm.

TER MASS., U. S. A.

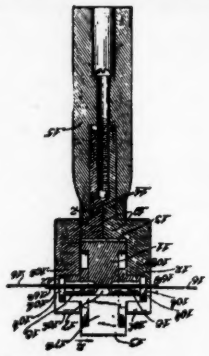
A REVIEW *of* RECENT PATENTS



Wire Winding Machine 1,704,166

Complete descriptions and drawings of any of the patents referred to on this page may be had for twenty five cents. Address orders to Wire & Wire Products, 551 Fifth Avenue, New York City.

No. 1,706,116, WIRE SPLICER. Patented March 19, 1929, by William F. Harrah, of Niles, Michigan. Assignor to National Standard Co. The patentee provides a light, manually operable splicer and claims that the device will readily splice wires under tension. Slotted jaws, and a rotor supported between the jaws and having a radial slot, twist the wire ends.



Wire Splicer 1,706,116

No. 1,704,166, WIRE WINDING MACHINE. Patented March 5, 1929, by Vincent Calabrese, of Los Angeles, California. Assignor to Joe Cuccio. It is the purpose of this invention to provide a wire winding machine particularly adapted for winding tuning coils as used in radio apparatus, the machine having automatic wire feeding and tensioning means. It is designed, apparently, as a portable hand operated device.

No. 1,704,542, METHOD AND MEANS FOR WEAVING WIRE FABRIC. Patented March 5, 1929, by Hamilton Lindsay, of Cleveland, Ohio, Assignor to Lindsay Wire Weaving Company, of Cleveland, Ohio. The wire fabric referred to is that used in connection with Fourdrinier papermaking machines and the method is claimed to eliminate water marks due to slight displacement of warp wires from the plane of the wire belt.

No. 1,706,702, STRAND WORKING MECHANISM. Patented March 26, 1929, by Samuel McMullan, of Riverside, Illinois. Assignor to Western Electric Company, Incorporated, of New York, N. Y. In this wire drawing machine the patentee provides uniform diameter guide rolls cooperating with a stepped drawing element, thus causing each pass of the wire through the dies to assume a different angle, provided with a die drawing block provided with a plurality of seats for positioning drawing dies, wherein the seats are formed at predetermined and differing angles so that the axis of the reducing aperture of each die placed thereon will coincide with the axis of the portion of the wire being drawn therethrough.

No. 1,704,195, FABRIC FOR WINDOW SCREENS, SCREEN DOORS, AND THE LIKE. Patented March 5, 1929, by William G. Illch, of Washington. In this invention, the warp wires have a greater diameter than the weft wires, so as to enable the former to be flattened for the purpose of providing shades or visors between the weft wires. These shades or visors are to be disposed at an angle to protect an enclosure against rain, dust, etc. but to permit light and air.

No. 1,703,885, MACHINE FOR STRAIGHTENING AND CUTTING WIRE. Patented March 5, 1929 by Frank Cole Huitchinson, of Ruthrford, New Jersey. The invention relates to means for cutting and straightening wire, and particularly to devices for this purpose which are adapted to receive wire as it is delivered to the user in large coils, feeding the wire from such a coil, straightening the same out into a straight piece and cutting off portions of the wire of predetermined length. One of the principal purposes for which wire of the kind referred to is used is in placing around packing cases and the like, and portions of wire used for this purpose require not only to be cut from the coil into appropriate lengths, but also to be fully straightened out in order to facilitate handling and securing around the case. The structure and operation of this apparatus is duplex since the machine can take care simultaneously of two wires.

No. 1,703,940, PLATED WIRE AND PROCESS OF MANUFACTURING SAME. Patented March 5, 1929, by Emil Kollmar, of Pforzheim, Baden, Germany, Assignor to General Plate Company, of Attleboro, Massachusetts. The process consists in covering a wire core with sheet-form plating metal, compressing and holding the metal forcibly thereagainst, encasing the held, covered core in a yieldable, heat-resisting jacket, heating the jacketed covered core to a temperature less than the melting temperature of the plating metal, subjecting the same to a welding pressure, and subjecting the plated core to an attenuating process to form plated wire.

No. 1,703,955, WIRE COILING MACHINE. Patented March 5, 1929, by John W. Ekstedt, of Belleville, New Jersey. Assignor to Westinghouse Lamp Company. Means are provided for directly forming wire into continuous spiral or helical coils without the aid of a mandrel and the machine is more especially adapted to operate upon exceedingly fine hairlike wire to coil the same into very small spiral or helical formations suitable for use as incandescent electric lamp filaments.

No. 1,705,821, MACHINE FOR FABRICATING WIRE SPRING STRUCTURES. Patented March 19, 1929, by Wesley G. Lehmann and David T. Owen, of Cleveland, Ohio. Assignors, by direct and mesne assignments to the Owen Automatic Spring Machinery Company, of Cleveland, Ohio. This invention relates to a machine for fabricating, especially, bed spring bottoms, spring cushions for upholstered furniture and auto seats and similar banks or groups of spiral wire springs. The machine feeds a strip of metal into the machine, produces flanged clips from this strip, raises each flanged clip to the flat top to permit the wires of two spiral springs to be seated therein, folds the flanges of the clip upon the wires, and upsets the folded clip and one or more of the wires.

No. 1,704,526, PRODUCTION OF WELDED WIRE FABRIC, AND APPARATUS THEREFOR. Patented March 5, 1929, by Alan Armstrong, of Whitley Bay, England. Assignor to Pilkington Brothers Limited, of Liverpool, England. This invention has for its object a process and apparatus for the production of welded wire fabric in which two pluralities of wires are welded at their crossing points, each wire of one plurality being at an angle to each wire of the other plurality. Besides the above mentioned pluralities of wires, the fabric may contain other wires, such, for instance, as selvedge wires running in the direction of the length of the fabric.

No. 1,707,165, MOP WIRING MACHINE. Patented March 26, 1929, by Louis F. Klipstein and John U. Barr, of New Orleans, Louisiana. This machine comprises a wire feeding and clamping means, wire cutting means, bending and guiding means.

Wilhelm Breitenbach

Machine Works and Foundry

OF UNNA, WESTFALIA, GERMANY

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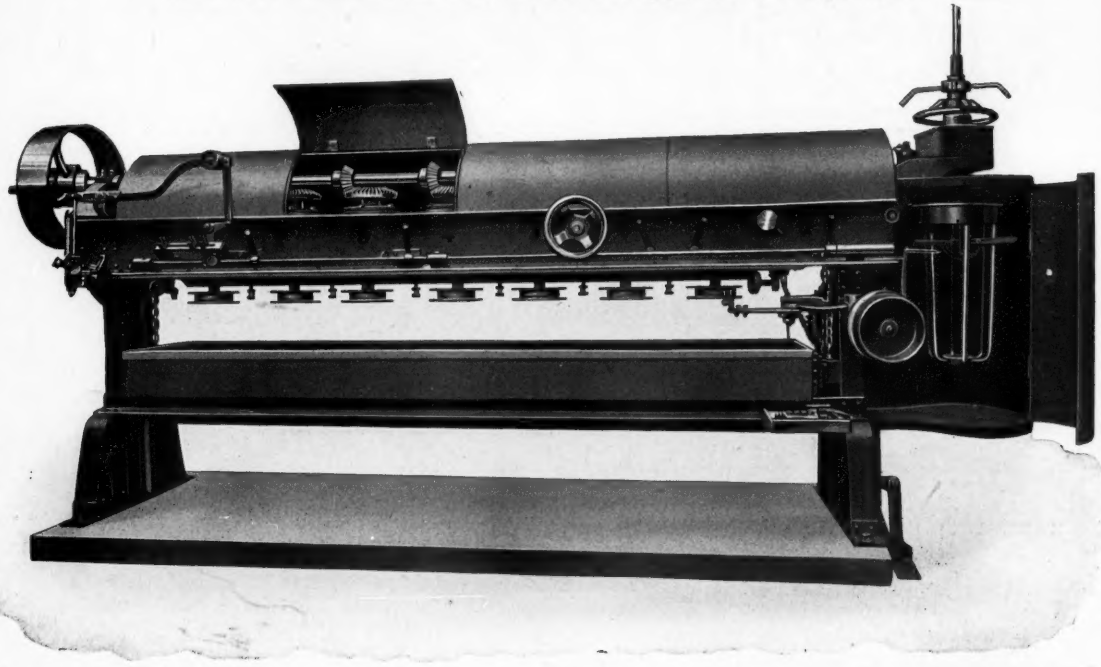
SPECIALISTS IN WIRE FORMING MACHINERY

I—PATENTED FRICTION DRAWING BENCHES of standard and special construction for light and heavy draft. Outstanding features are: spiral spring friction clutch of special design; patented spindle-gear on ball-bearings, all enclosed in oil filled casing.

II—BENCHES FOR THE DRAWING OF LIGHT AND CARD WIRE of standard and special construction.

Of Exceptional Interest Are:

1—Light and Card Wire Benches with spiral spring friction clutch for special wire.
2—Light and Card Wire Benches with instantaneous disengaging coupling.
3—Card Wire Benches with built in spooling apparatus for Rope Wire.



III—PATENTED MULTIPLE DRAWING BENCHES for Iron Wire of from 3.5 mm. dia. Drawing drums and drawing stones fully submerged in cooling drawing liquid while machine is in operation. The output of 1000 kilogr. of from 0.8 to 2.2 mm. dia. iron-wire per man per day (eight hours) is unsurpassed.

IV—SPOOLING APPARATUS equipped with individual driving gears for the Annealing and zincing of Steel Wire. All dimensions.

V—SPEED WINDLES for the respooling of zinced wire. Apparatus for Wire Washing, Spraying, etc., etc.

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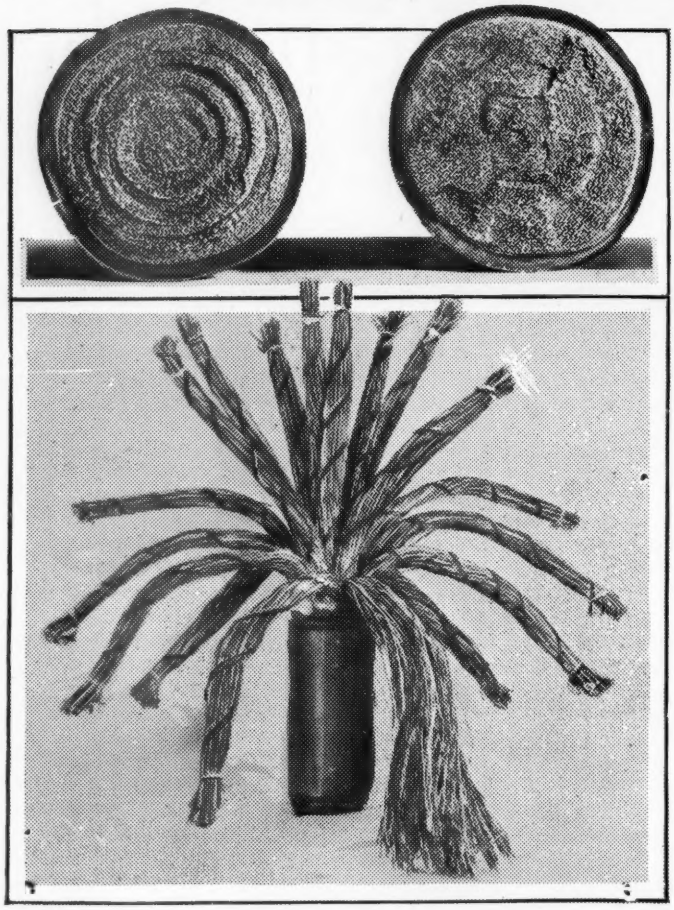
New 1818 Pair Telephone Cable



An end of the new cable with sheathing removed to show eighteen separate units. The binding on one of the units has been taken off, leaving 101 pairs of wires hanging loose. Top—On the left is a cross-section of the 1212 pair cable showing the circular layers. On the right is the 1818 pair cable showing the separate groups.

FOR the first time since the invention of the telephone it is possible to carry on as many as 1818 conversations simultaneously over a single cable which has an extreme diameter of 2⅝ths inches. To make this possible 3636 wires about half the diameter of an ordinary pin are insulated and encased in a sheath of lead.

The process of insulating these small wires is an interesting one. Before this could be accomplished on a quantity production basis high-speed machinery had to be developed for winding the individual wires with extremely thin paper without breaking it. Such machines have been developed by engineers of the Western Electric Company, the manufacturing subsidiary of the Bell System, and soon many billions of feet of wire will be wrapped with insulating paper each year for use in telephonic communication.

Each telephone instrument is served by two strands of paper covered wire twisted together. Before this recent development the maximum capacity of cable was 1212 pairs of wire. The constantly increasing demand for telephone service, however, make cable improvement of primary importance which resulted in the 1818 pair cable.

Another interesting detail is the arrangement of the wires under the new system of manufacture. Previous cable was made by spiraling on layers of

wire until the full size was reached. A cross section of this type of cable consequently looked like the cross section of a tree. In other words, it showed circular rings. The new cable consists of 18 groups. Each group is made up of 101 pairs of wire. These 18 units are finally twisted together, after which the cable is covered with a lead sheath and is ready for installation.

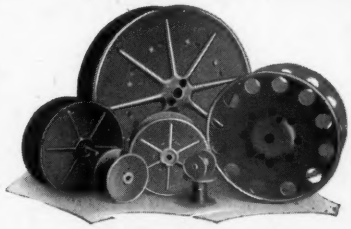
In order to distinguish the individual groups, one from the other, different colors of paper are used in the wrapping. Some pairs are red and white, others blue and white, while a third group may be red and green. This is done to facilitate the splicing of cable, each color identifying a particular group.

New Furnace Revolutionizes Brass Melting

(*Continued from page 151*)

able fuel saving is in the fact that 800 degrees Fahrenheit of heat remain in the retort the following morning, excepting, of course, Mondays.

This announcement is not made public until after repeated and exhaustive tests have been made under the most exacting conditions. The first installation in commercial practice is at the plant of the Trenton Brass & Machine Company of Trenton, N. J., a concern manufacturing plumbers' supplies and selling direct to jobbing plumbers and makers of sanitary ware. As may be imagined, this discovery was brought about by the American Gas Association's plan of cooperative research, efficiently administered under the direction of the Executive Board, by the Industrial Gas Research Committee of which F J. Rutledge is Chairman and E. D. Milener, of Association Headquarters staff is Research Representative. It bids fair, to repeat the opening sentence of this statement, to revolutionize practice in the more than 3,000 foundries of the United States and Canada where brass is melted.



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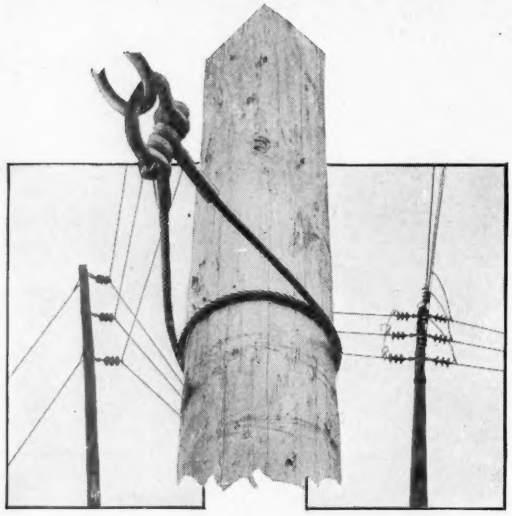
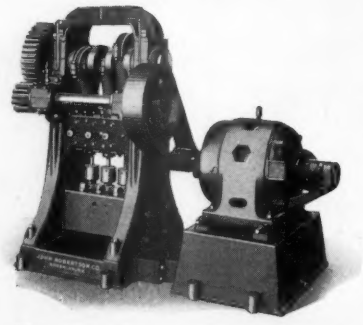
New Type of Dead End Sling



PUBLIC utilities have long regretted the necessity for boring a hole through a telephone pole whenever it became necessary to dead-end or turn the direction of a transmission line. Because creosoted poles are gaining favor this cutting or boring exposes the untreated wood to the elements—with decay and weakened structure as a result. Now, through the development of a new type of dead end sling, by the American Cable Company, New York, all necessity for mutilating corner or dead-end poles has been eliminated. The use of wire rope for dead end slings was cumbersome and impractical until the development of the preformed type of wire rope which permits the attachment of the compact, positive, processed fitting.

These fittings, which are shown attached to the wire rope and which fit into the schackle and cotter-pin bolt, are merely steel cylinders which have been slipped over the unseized end of the preformed rope, then by means of 100 tons hydraulic pressure, so processed as to cold flow the steel into the interstices of the wire rope, thereby locking it to the rope with unfailing security. The efficiency of this fitting has been abundantly proved by their adaptation to such uses as the brake assemblies on many automobiles and to their usage on countless other machines where both compactness and positive, non-slipping grip are necessary. This new type of dead end sling is being adopted by several public utilities and railroads, and the new device promises wide application in all fields.

New High Pressure Hydraulic Pump

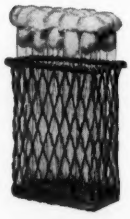


LEAD extrusion presses, used by rubber hose manufacturers for lead incasing hose previous to vulcanizing and by electrical wire and cable manufacturers for incasing cables, require hydraulic pumps that will continuously deliver a large volume of water at high pressure. The hydraulic pump illustrated is designed for such continuous service and is furnished in sizes up to 50 gal, per min. and for

working pressures up to 6500 lbs. per sq. in. It is made by John Robertson Co., 121-137 Water St., Brooklyn, N. Y.

The pump has a steel shaft with large diameter eccentric bearings which are bronze lined throughout. The main bearings are babbit lined and the eccentric and main bearings are lubricated automatically from a 2½ gal. oil reservoir. The knuckle joints are bronze lined and work in oil. The plungers are of "non-rust" steel and operate in a forged steel pump chamber which is bronze bushed and fitted with removable bronze valve seats. The packing chambers are deep and easily accessible. Each pump is equipped with a hydraulic safety valve of sufficient capacity to relieve full discharge of the pump without a substantial increase in pressure.

New Wire Test Tube Basket



IN the college bacteriological laboratory where each student prepares his own culture tubes and places them in a common incubator or sterilizer, the need for a smaller test tube basket resulted in a device for the purpose made by Fisher Scientific Company, Pittsburgh, Pa.

The basket is 4 inches wide, 2½ inches deep, 5 inches high, and holds 15 test tubes, 6x⅝ inch size. The material is 1/16 inch iron wire heavily galvanized after forming to insure a protective coating that will withstand moisture and steam sterilization without rusting. An advantage of the wire basket over the small size cans often used for the purpose is the absence of the cold air pocket that forms in the lower part of the can.

Rust trouble completely eliminated.

A large Ohio wire mill experienced periodical rust trouble during baking operations. All efforts to remedy this situation proved ineffectual until an Oakite Service Man was asked to study the problem.

Upon the recommendation of this man, a solution of an Oakite material was used to neutralize acids after pickling. Immediately rusting troubles were completely eliminated; wire took a good "sharp" pickle and considerable time and money were saved.

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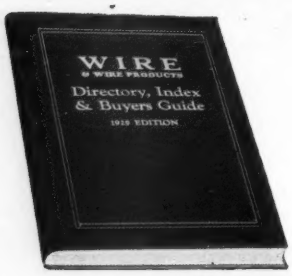

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Wire Trade Exports and Imports For 1928

Commodity and rank in Order of 100 Chief Exports	Value of exports Expressed in Dollars			Per cent change in 1928 from—	
	1928	1927	1923-1927 average	1927	1923-1927 average
57. Iron and steel bars and rods	12,824,000	9,083,000	10,881,000	-|- 41.2	-|- 17.9
63. Copper rods	11,066,000	8,870,000	8,557,000	-|- 24.8	-|- 29.3
82. Plain, galvanized, and barbed iron and steel wire	7,844,000	5,999,000	8,796,000	-|- 30.8	-- 10.8
85. Copper wire, including insulated wire and cable	7,441,000	6,855,000	6,324,000	-|- 8.5	-|- 17.7

Commodity and rank in Order of 100 Chief Exports	Quantity exported Expressed in 1000's of pounds			Per cent change in 1928 from—	
	1928	1927	1923-1927 average	1927	1923-1927 average
30. Iron and steel bars and rods....	486,985	307,495	352,290	-|- 58.4	-|- 38.2
40. Plain, galvanized, and barbed iron and steel wire	258,299	185,316	246,726	-|- 39.4	-|- 4.7
71. Copper rods	71,324	58,617	56,598	-|- 21.7	-|- 26.0
80. Nails	54,744	41,263	63,372	-|- 32.7	-- 13.6
96. Copper wire, including insulated wire and cable	35,320	32,779	28,119	-|- 7.8	-|- 25.6

THE data are based on the official statistics published by the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce, Washington, D. C., especially in the "Monthly Summary of Foreign Commerce of the United States," which are subject to revision.

New Line of Materials Handling Equipment

A COMPLETE new line of improved electric and hand power cranes, hoists and trolleys up to 10 ton capacity is announced by Robbins & Meyers, Inc., of Springfield, Ohio, pioneer manufacturers of electric motors, motor-generator sets and electric fans. The executive, technical and sales personnel of the new division were all formerly associated with the Chisholm-Moore Manufacturing Company of Cleveland in similar capacities.

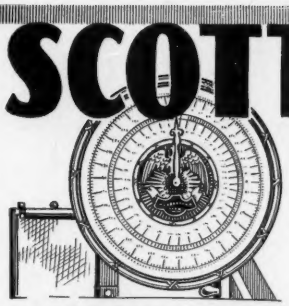
Frank F. Seaman, who has been appointed General Manager of the Robbins & Myers Crane and Hoist Division, is one of the outstanding electric hoist men in the country. Since 1902 he has been engaged continuously in the design, manufacture and sale of hoisting machinery with the Sprague Electric Works, Yale & Towne, Toledo Bridge & Crane Company, Euclid Crane & Hoist Company and Chisholm-Moore.

Carl E. Schirmer, Chief Engineer, is another old-timer, having been in the business since 1907. He was formerly assistant engineer of the material handling divisions of both the Union Pacific Railroad and the Schaffer Engineering Company of Tiffin, Ohio; chief engineer for the Toledo Crane Company at Bucyrus, Ohio, and recently crief engineer for Chisholm-Moore.

Sales will be in charge of John R. Mears, a veteran of fifteen years' experience in hoist and crane sales, while Albert Kreh, Wiliam J. Scott and John J. Becker who are district sales managers for New York, Chicago and Detroit respectively, are all old hands who know the business inside-out, who will be able to give buyers engineering counsel on their crane and hoist needs.

Robbins & Myers hoists, crane and trolleys will include all sizes and styles, both hand and electric power, up to 10 tons capacity. They have been designed to incorporate the most modern improvements in materials handling machinery and built in keeping with the Robbins & Myers tradition of precision workmanship which has given R. & M. electrical products a 31 year-old reputation for "plus" service.

SCOTT



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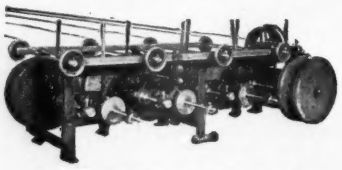

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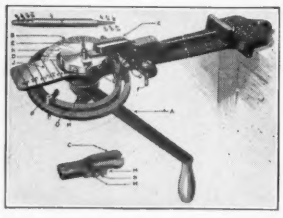

Patented April 2, 1918

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Wire Saw Proves Success

THE wire saw has met with such unqualified success in the slate-quarrying industry that its use could be satisfactorily extended to slate-finishing mills, it was suggested April 12 by the Bureau of Mines, Department of Commerce.

The wire saw, a novel device introduced into this country by the Bureau of Mines about two years ago, and described at length in "Wire and Wire Products" for May, 1928, has revolutionized slate quarrying in Pennsylvania. The success of the wire saw since its early accomplishments has become greater and greater as the equipment has been perfected and skill acquired in its use.

The wire saw consists of a three-strand steel cable of 3/16 or ¼ inch diameter running as an endless belt. The driving pulley is a 40-inch double-groove cast-iron sheave. A tension pulley supported by a frame mounted on wheels may travel back and forth on a short track.

A weight of 800 to 2,000 pounds gives the desired tension on the wire. The driving units consist of electric motors with direct-drive compactly enclosed gear reduction, or double-belt speed-reduction units; the former is preferred. Silent chain and pinion gear reductions are used to a limited extent. The travelling speed of the wire is about 15 feet per second.

The unqualified success of the wire saw in slate quarries suggests an extension of its use in slate-finishing mills. In mills where circular saws are now employed the blocks might be lined up in such a way that many of them could be cut at one time with a wire. Ten to 20 blocks are lined up and a wire is used to "scabble" or square them up by slabbing off the irregular surfaces.

The equipment would be much simpler and less expensive than circular saws. The designing of such a mill has not yet been undertaken, but it offers a fruitful field for enterprising operators.

Lead Wool in the Making

(*Continued from page 157*)

is effected in the elimination of dross and oxidation, which are invariably present with the molten lead. Lead wool can be used under water or in wet trenches where it would be physically impossible to use molten lead, cement or any other substitute. It has a further advantage in allowing inspection immediately, thus obviating the delay necessary where material must harden or settle.

Makes Flexible Joints

In calking with lead wool, the lead is tapped into the bell of the pipe immediately after the oakum is placed. No other preparation is necessary. Once in place, lead wool does not contract, whereas many of the other materials do contract after drying or settling, and often cause much grief when inspection proves their weakness. Another factor given only by lead wool is a great flexibility of the joint. Before the advent of lead wool, it was an accepted weakness of calking materials to break and crack when strain was placed on the line. Lead wool overcomes this difficulty. It "gives" with the pipe and the joint remains tight up to a deflection of 15° or more.

Lead wool also finds its use in emergency repairs on plumbing, heating, and gas lines, water mains, and other places where pressure lines are cracked or broken. Lead wool is tamped into the break much the same way that a crack in a rowboat is filled with hemp to stop a leak, and often this temporary repair is so successful that no need of new installation is necessary.

In the oil and gas fields of the Mid-West, Texas, California and other territories, lead wool again finds its utility. The water problem so often encountered in the production of oil, and accepted as a necessary evil in some districts, is a difficult one to eliminate. In times past cement was used, together with crushed rock, brick and other materials, to fill the holes. Today lead wool is the only material used by some of the larger oil companies. Often lead wool and cement are used together.

The attempt to shut out water is not made until after the well has proven successful and until it is ascertained that the plugging of the water will not also shut off the supply of oil. However, when after the regular production of oil, water persists in appearing, some method must be devised for stopping its entrance into the well. The ingress of the water can be very accurately estimated. In the California fields an electrical device has been perfected, which has received the appropriate title of "Water Witch". With this instrument, the place where the water is entering is very definitely fixed. Generally water appears in sandy strata and is expected to accompany the oil. Water, in the ordinary process, comes first with the oil and later separate from it, merely filling the cavities left as the oil is taken. When this happens the procedure for plugging is comparatively simple.

Applied Under Water

Lead wool is sometimes lowered to the spot in loose form, merely wrapped around a stick, and once in place is forced into the holes from which streams of water are coming. Another method is to place the lead wool in a very thin metal conveyor, or a wire cage, thus keeping it more compactly together until at the exact spot needed. When in location, pressure is applied, bursting the conveyor and pressing the lead wool into the holes to stop the flow of water. Burlap sacks are also used in the same way, and other novel methods have been employed to place the lead wool according to the peculiarities of specific instances.

Lead wool is marketed in units of 25, 50, 100 lbs. and 125 lbs.—the smaller lots more generally being used for individual plumbing jobs and the larger units being called for by contractors on large installations, or for oil well jobs.

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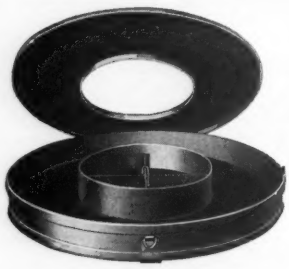

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OUR WIRE MACHINERY CATALOGUE SENT ON REQUEST

New Mill Treats Wire Manufacture as a Handling Problem

(*Continued from page 154*)

length to carry four hundred pound bundles.

The double-deck reels serving this unit are commanded by traveling cranes and are loaded with four hundred pound wire bundles from skid trucks parked under the same cranes. Similarly the take-up blocks and the skids receiving galvanized wire are commanded by cranes.

After passing over platform scales in the transept, skids loaded with galvanized wire pass into a bay from which wire is distributed north to the field fence or south to the barb fence machines. This bay is served by a traveling crane with a one-ton electric hoist carrying a hairpin hook. Galvanized wire is loaded on edge and may be picked off the skids by this hook in one-ton lifts and as the crane interlocks with tramrails running in between the reel sets of the field fence machines the wire can be stacked on edge in floor racks adjacent to these reels and rolled to and onto them without lifting. Similar arrangements provide for feeding the barb fence machines.

Equipment for bale ties and for blued and galvanized nails and other specialties are now installed in the galvanizing room in space reserved for a future galvanizing unit. The general layout provides for an expansion of cleaning and baking facilities in the same building, extensions to both wire drawing and nail making departments and a westward extension of the fence and warehousing bays. A cooper shop is located beside the nail mill, delivering kegs to the nail cleaning department by conveyor.

Warehousing and delivery into cars is now handled by the lift truck and skid system.

Morgan Construction Company were consulting engineers on the entire installation. All crane and tramrail equipment in the rod storage and wire plants was supplied by the Cleveland Crane & Engineering Company.

Poultry Men Find New Wire Uses

(*Continued from page 158*)

Where "sun porches" are used and they are highly advisable in connection with the confinement system—they must be equipped with a wire floor, and, if possible, made fly-tight to prevent tapeworm infestation. A practical and effective way of accomplishing this is shown in the accompanying illustration. About six inches below the wire floor, sliding on cleats, are trays which catch the droppings. When covered with a layer of peat moss or similar material, these dropping trays require but little time for cleaning, and they do not have to be cleaned so often.

Chicks will not take full advantage of a sun porch with a wire floor if the house itself is not equipped with wire floors. They prefer the litter covered floor. Under such conditions the chicks have to be forced to take their "sunbath" by removing the feed and water from the house to the sun porch. During the hot weather period, this should, of course, be done early in the morning or in the late afternoon to prevent sunstroke.

Character of Summer Houses

As soon as the chicks can safely do without heat some should be transferred from the wire floor brooder house to so-called summer houses, which are equipped with a wire floor (three-fourths inch mesh). These summer houses may either be movable, in which case no other floor but the wire frame is necessary, or it may be of the stationary type. The latter should be equipped with a permanent dropping board, about twelve to eighteen inches below the wire floor, leaving enough space to remove the droppings with a scraper.

Of course, feeding and watering utensils should be so arranged and constructed as to prevent the birds from standing in the feed troughs or watering vessels, thus contami-

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URDIKA

WIRE DIE WORKS

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(*Continued from page 175*)

nating them with droppings. There is nothing gained by the use of wire floors unless the requirement of the sanitation program is fully met.

Chicks on wire require even somewhat more floor space than ordinarily recommended with the confinement system, unless a sun porch is provided. Chicks that have been started from the beginning on wire floors will, with very rare exceptions, have no trouble with sore feet. Chicks put on a wire floor at a later age may occasionally develop a soreness of the feet, but this difficulty is not apt to be general in the flock.

Statement of ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of Wire & Wire Products published monthly at Washington, N. J., for April 1, 1929.

State of New York, County of New York, ss.: Before me, a Notary Public in and for the State and county aforesaid, personally appeared Richard E. Brown, who, having been duly sworn according to law, deposes and says that he is the Publisher of Wire & Wire Products and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Quinn-Brown Publishing Corporation, 551 Fifth Avenue, N. Y. City; editor, Frank Quinn, 551 Fifth Avenue, N. Y. City; managing editor, none; business manager, Richard E. Brown, 551 Fifth Avenue, N. Y. City.

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RICHARD E. BROWN.
(Signature of Publisher)

Sworn to and subscribed before me this 13th day of March, 1929.

(SEAL) MARY ELIZABETH FLINT,
Notary Public.

My commission expires March 30, 1930.

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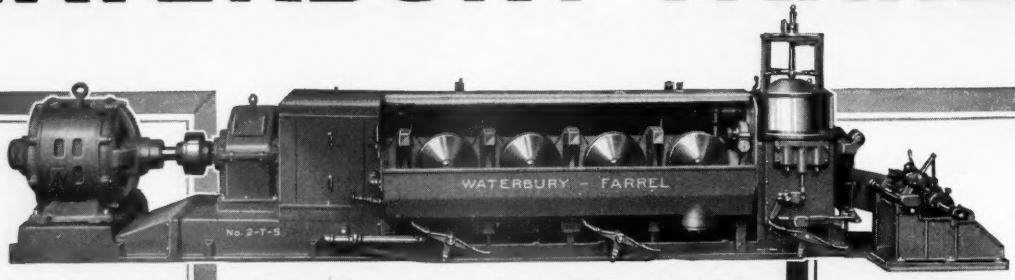

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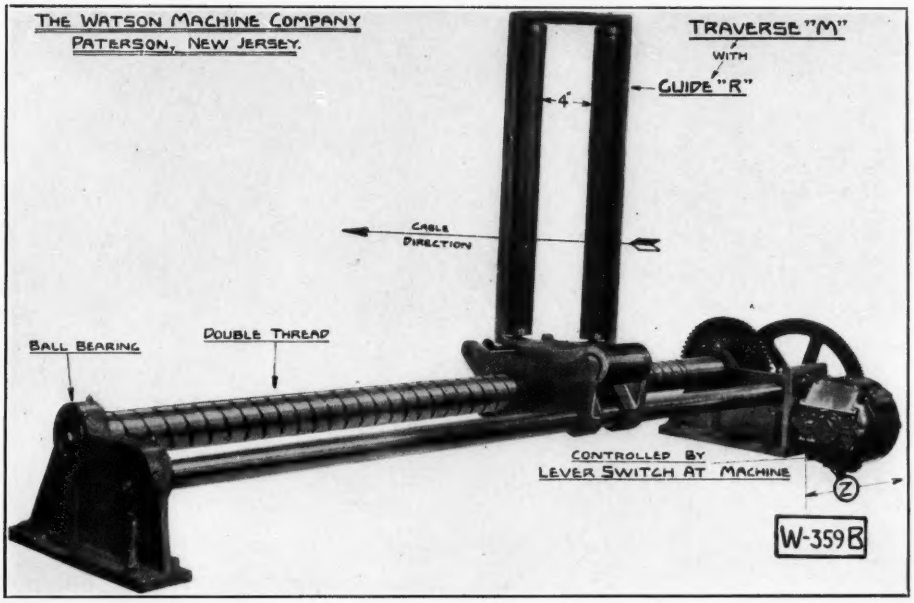

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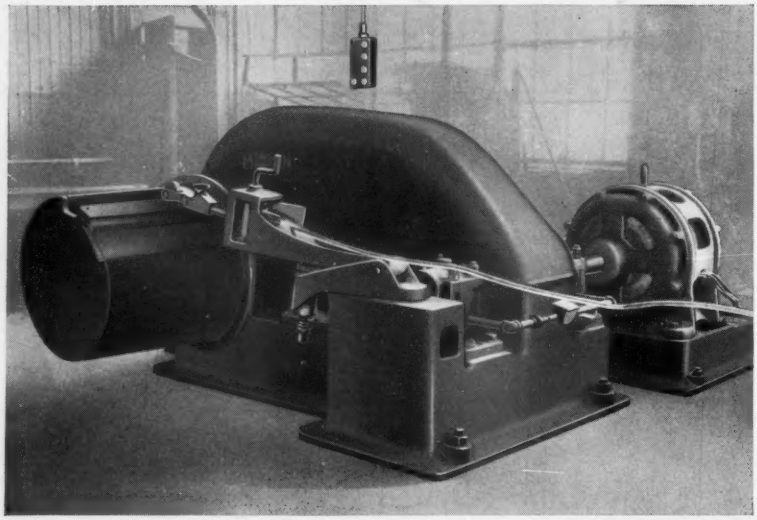
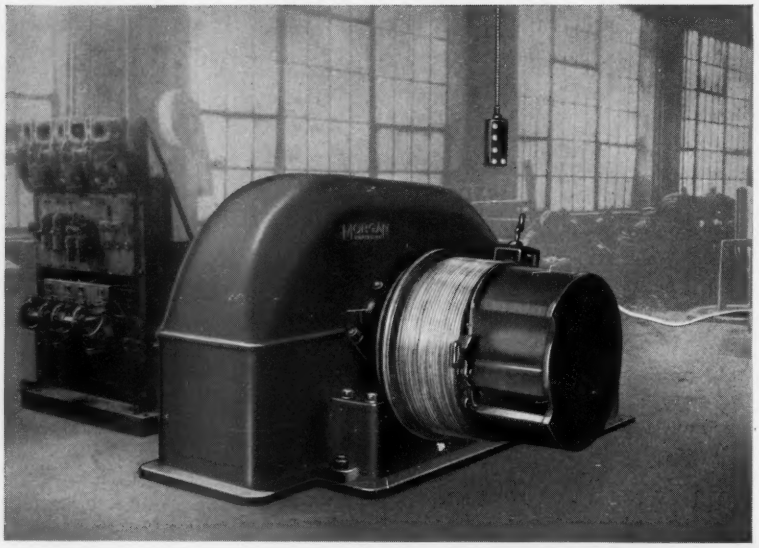
MORGAN BULL BLOCK





Handles cold drawn product from ½ inch to 1 inch round and equivalent sections in other shapes. The motor, transmission and drawing block are one unit. Machine is started, stopped, reversed and controlled in all its movements by push-button through a small pendent panel over the die box.

Morgan Construction Co., Worcester, Mass.

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